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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/736,864	12/14/2000	Takahiro Iijima	CU-2417 RJS	8303

7590 06/25/2002

Ladas & Parry
224 South Michigan Avenue
Chicago, IL 60604

EXAMINER

CHU, CHRIS C

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 06/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/736,864

Examiner

Chris C. Chu

Applicant(s)

IIJIMA ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 14 is/are pending in the application.
- 4a) Of the above claim(s) 2 - 10, 12 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 11 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I in Paper No. 5 is acknowledged. The traversal is on the ground(s) that "[A]pplicants respectfully traverse the election of the species restriction requirement. It is respectfully submitted that the inventive features are present in all the independent claims of Group I. Applicants shall rely on the patentability of the main independent claims for a showing of unity of invention." This is not found persuasive because the other species claims of the instant invention, especially, claim 3 recites the following sentence, "a plating metal filling each of said penetration holes." This clearly shows that the species are patentably distinct. Therefore, examiner does not agree with the basis of the applicant's argument that "[I]t is respectfully submitted that the inventive features are present in all the independent claims of Group I. Applicants shall rely on the patentability of the main independent claims for a showing of unity of invention." However, if applicant states for the record that the apparatus claims and method claims are not patentably distinct, then the restriction requirement will be withdrawn.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "107" and "105" in Fig. 2A have both been used to designate a semiconductor element. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect may be deferred until after the examiner has considered the proposed drawing correction. Failure to timely submit the proposed drawing correction will result in the abandonment of the application.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined

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was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1, 11 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Grube et al.

Regarding claim 1, Grube et al. teaches in Fig. 6A, column 9, lines 1 ~ 3 and column 12, lines 51 ~ 56 a multilayer interconnection substrate comprising:

- an uppermost interconnection layer (610) having a plurality of terminal pads (the structure under 620a) at positions corresponding to a plurality of external connection terminals provided on a semiconductor element which is to be mounted on said multilayer interconnection substrate;
- a metal column (620) formed on each of said terminal pads;
- a resin film (622) covering a side surface of said metal column; and
- an insulating layer (612) formed on said uppermost interconnection layer so that a gap (614) is formed between the insulating layer and an outer peripheral surface of said resin film.

Regarding claim 11, Grube et al. teaches in Fig. 6A, column 9, lines 1 ~ 3 and column 12, lines 51 ~ 56 a semiconductor device comprising:

- a multilayer interconnection substrate which comprises
- an uppermost interconnection layer (610) having

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- a plurality of terminal pads (the structure under 620a) formed at positions corresponding to a plurality of external connection terminals provided on a semiconductor element which is to be mounted on said multilayer interconnection substrate;
 - a metal column (620) formed on each of said terminal pads;
 - a resin film (622) covering a side surface of the metal column; and
 - an insulating layer (612) formed on said uppermost interconnection layer so that a gap (614) is formed between the insulating layer and an outer peripheral surface of said resin film; and
- a semiconductor element (402) mounted on said multilayer interconnection substrate (432).

Regarding claim 13, Grube et al. teaches in Fig. 6A, column 9, lines 1 ~ 3 and column 12, lines 51 ~ 56 a semiconductor device comprising:

- multilayer interconnection substrate manufactured by
 - forming a plurality of terminal pads (the structure under 620a) in an uppermost interconnection layer (610);
 - forming an insulating layer (612) on said uppermost interconnection layer;
 - forming openings (606) in said insulating layer, the openings located at positions corresponding to said terminal pads;
 - filling each of said openings with metal particles;
 - forming a metal column (620) in each of said openings by heating said metal particles at a temperature which melts said metal particles; and

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- removing a part of said insulating layer near but not adjacent to a peripheral side of said metal column, while leaving a part of said insulating layer (622) adjacent to said peripheral side of said metal column, so that a gap (614) is formed around but not adjacent to said peripheral side of said metal column; and
- a semiconductor element mounted on said multilayer interconnection substrate.

Further, the claim 13 is product-by-process claim, even though product-by-process claim is limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A “product by process” claim is directed to the product per se, no matter how actually made, In re Hirao, **190 USPQ 15 at 17** (footnote 3). See also In re Brown, **173 USPQ 685**; In re Luck, **177 USPQ 523**; In re Fessmann, **180 USPQ 324**; In re Avery, **186 USPQ 116**; In re Wertheim, **191 USPQ 90** (**209 USPQ 254** does not deal with this issue); and In re Marosi et al., **218 USPQ 289** final product per se which must be determined in a “product by, all of” claim, and not the patentability of the process, and that an old or obvious product, whether claimed in “product by process” claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Usagawa et al., Ishida and Nakamura disclose a multi-layer structure.

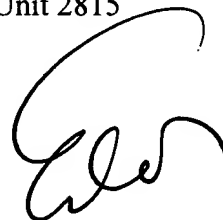
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu
Examiner
Art Unit 2815

c.c.
June 21, 2002



EDDIE LEE
SUPERVISORY PATENT EXAMINER
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